BENCHMARK THE SRI LANKAN POWER SYSTEM BY POWER QUALITY MONITORING AND ANALYSIS

Master of Science Dissertation

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Abstract

The increased requirements on supervision, control, and performance in modern power systems make power quality monitoring a common practise for utilities. To get the present status of the power quality in the network is so vital as these data are necessary to benchmark the system. Though utilities around the world have done this type of surveys for their system, the similar monitoring project has not been done for the CEB network.

Aim of the work presented in this thesis is the benchmark the Sri Lankan Power system by selecting most suitable sites distributed in all over the island. This part would be much important as the selection should be made represent the entire network.

This thesis report firstly introduces the reader to the available standards of power quality, comparisons and how they are applied to monitor the Sri Lankan power network. The objectives of the analysis include the identification of the event origin, the accurate description of the power quality indices in a compact way and the interpretation of all phenomena related to the event

However, the actual power quality database must be maintained with data in standard formats for comparisons, analysis, and reports. As standards bodies define performance indices for power quality, utilities may want to benchmark system performance using these indices so that they can offer differentiated services for customers that have special requirements.

After careful analysis of the results obtained from each site it was found that the quality of the power at each location was quite satisfactory, with the exception of flicker and voltage dips which addressed the cases separately. The application of the standard, EN 50160, to our system is widely discussed as it is the first "electricity as a product" standard in the world.

Voltage dips are common events on the electric power network. They can affect a wide range of electrical equipment and are of particular concern to industrial applications. The survey duration must be sufficient to include the full range of all the factors that affect sag incidence and it is therefore accepted that a minimum period for acceptable results is one year [3]. Though one year monitoring for a site is not practically possible with this project, the short term results were also produced and discussed for future projects about exercising suitable dip reporting methods.

As the background activities certain cases related to the network reactive power switching are also discussed and remedial actions are also proposed.